

## **Emergy Methods: Valuable Integrated Assessment Tools**

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NHEERL's Atlantic Ecology Division is investigating emergy methods as tools for integrated assessment in evaluating environmental impacts, policies, and alternatives for remediation and intervention. Emergy accounting is a methodology that provides a quantitative perspective of environmental costs and benefits using a common unit of measure. Emergy is calculated by determining all of the energy and materials required to produce a given quantity of a product or service. Solar energy, deep earth heat, and gravitational attraction of the sun and moon are the primary emergy inputs to the earth, which provide a baseline from which chains of production processes can be evaluated leading to the final ecological and economic products. Emergy evaluation can be applied to any item or process in any system, whether it is a pollutant, the work done by transpiration in a natural system, or the economic systems that differentiate between cities and rural areas. This poster presents the theoretical foundation for emergy and then focuses on the three projects in progress—one using methods similar to financial accounting and bookkeeping to evaluate environmental assets and liabilities for different states in the U.S., the second providing a landscape perspective of emergy and watershed physics to assess water body conditions and evaluate policy alternatives, and the third demonstrating the similarities and differences between emergy and economic cost/benefit evaluations.